

Discussion on "Development of a 352 MHz, low- β Superconducting Re-entrant Cavity at LNL" by Alberto Facco

Some results were clarified during the discussion. The tuning sensitivity is about 0.5 MHz/mm, which agrees with the simulations. The Lorentz Force Coefficient has been calculated for the unconstrained case and will be smaller in a real environment. The tuning force is about 1000 N.

Rusnak pointed out that the maximum voltage obtained for this cavity so far is below the voltage, where the Hatch diagram predicts the onset of 2-point multipacting. For a 30 mm gap at the iris 2-point multipacting would start around 800 kV. Thus the cavity might be limited to the gradients obtained so far (that correspond to approximately 700 kV). Facco answered that also for other reasons the achievable gradient for this structure is limited to 800 - 1000 kV.

The compact structure lends itself to strong focusing lattices. This allows small apertures. Facco has not investigated the lower limit in β , where such a cavity could be used. Their study was in the framework of a 5 MeV RFQ.

Shepard suggested to present the results of this "multipacting free" resonator to the Stanford group, whose HEPL cavity in the 1970s was the first re-entrant superconducting design.

Delayen expects HOM problems in this structure for beam currents above 30 mA. Facco answered that for the planned cw-operation simulations have been done and problems are not expected.

The final discussion focused on the real estate gradient that can be achieved (in the TRASCO design). The TRASCO design accumulates 100 MV over a length of 50 m with this structure, which corresponds to 2 MV/m at peak fields less or equal about 24 MV/m and 40 G. There might be a modification of this number, as the design has not advanced to the point, where the cavity spacing including cryomodule, warm-to-cold transitions etc has been established.